Project Report: Characterization of the early bombardment through the investigation of lunar breccias

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Project Progress

The initial phase of work to characterize the early bombardment of the inner solar system has consisted of selecting and separating pure melt rock from lunar highlands breccias. The purpose of this work is to fingerprint the late additions to the Moon using the relative abundances of the highly−siderophile elements that occur in generally high abundance in likely impactors, but extremely low abundance in the indigenous lunar crust. Towards this end, approximately 2g of two Apollo 17 breccias, 73215 and 73255 were requested and have been obtained from the Johnson Space Center curatorial facilities. In collaboration with Dr. Odette James, a longstanding expert on these rocks, Dr. Walker and his students have cleanly separated 13 chips from 73215 and 6 chips from 73255 for processing for Os isotopes and measurement of highly siderophile element abundances. At present (June, 2004), we are doing final checks on chemical blanks for the separation and measurement procedures to be used on these rocks. Analytical work consisting of powdering, dissolving, separating elements of interest, and mass spectrometric measurements will begin in July, 2004.

Highlights

- ***Apollo 17 lunar melt rocks have been selected and are ready for analysis of highly siderophile element abundances and osmium isotopic compositions.***

Roadmap Objectives

- ***Objective No. 1.1:*** Models of formation and evolution of habitable planets